**INTRODUCTION**

COPD threatens the lives of more than 3 million people every year (WHO, 2015) and reduces quality of life. Diagnosis of COPD relies on a number of factors including spirometry readings (GOLD, 2014). Spirometry is however sometimes not very well tolerated in the elderly and the very young. An assessment based on tidal breathing may therefore be desirable.

Structured light plethysmography (SLP) is a novel, non-contact technique that measures tidal breathing through estimating the displacement of the thoraco-abdominal (TA) wall. A structured grid of light is projected onto a subject’s chest and abdomen and changes in the grid pattern are quantified over time. This provides a one dimensional signal corresponding to that subject’s tidal breathing pattern.

We hypothesised that tidal breathing parameters measured using SLP can distinguish COPD patients from healthy subjects.

**SUBJECTS AND METHODS**

Clinical utility of SLP was examined in a cohort of 25 COPD patients and 25 healthy subjects matched for age, gender and BMI. The matching process was done to minimise the confounding factors.

Subjects were seated upright in a high-backed chair with their back supported.

**TIDAL BREATHING PARAMETERS**

Median and interquartile range (IQR) of 11 tidal breathing parameters of Respiratory rate (RR), Inspiratory time (IT), Expiratory time (ET), and Inspiratory Time/Expiratory Time (I:E) were measured. Five minutes of tidal breathing was acquired for each subject. Figure 1 shows how the SLP is used in practice.

% ribcage contribution, thoraco-abdominal asynchrony (TAA), time to peak tidal expiratory flow, time to peak tidal inspiratory flow, and inspiratory time were extracted from every detected breath. Figures 2 and 3 illustrate these indices.

**RESULTS**

The table below summarises how these tidal breathing parameters differ between COPD and healthy subjects. All the starred parameters retained their significance after accounting for multiple comparisons using the Benjamini-Hochberg procedure with 10% false discovery rate.

**REFERENCES**